
SHOCKPROOF

DENTAL RADIOGRAPHY



AN INCOMPARABLE PRODUCT
THE RESULT
OF
MORE THAN FIFTY YEARS' EXPERIENCE
IN A SPECIALIZED FIELD



The Waite & Bartlett X-Ray Mfg. Co.
ESTABLISHED 1879

10-63 to 10-75 Jackson Avenue, Long Island City, New York

THE TREND IS TOWARD SAFETY

THE Dental Profession is well aware of the fact that an X-Ray machine is an all important piece of equipment in Dental Practice. The Waite and Bartlett X-Ray Manufacturing Company will confine the text of this booklet to a description of such apparatus.

The trend of all electrical apparatus today is toward safety. This is particularly true in apparatus that employs high tension current as X-Ray equipment does and where the lead wires are within striking distance of the patient, doctor, nurse, or office equipment.

In the past the only known way of transmitting this high tension current while still maintaining any degree of flexibility was to place the transformer in a cabinet in some remote place, step up the house current from 110 or 220 volts to 45000 or more volts, and lead this high tension current from the transformer by means of wires to the X-Ray tube, which must of necessity be near the patient. Since there was no reliable way of insulating these wires, it was necessary to have them exposed. It is an established fact, that high tension current would jump or arc a distance up to 12 inches from these wires to any nearby conductor.

It was always necessary to warn new operators to keep these wires at least one foot away from the patient or operator to prevent shock and to keep the leads at a like distance from all operating equipment, radiators, steam pipes or any other conductors of electricity.

When Dr. Harry F. Waite first introduced his invention of the shockproof X-Ray unit to engineers and physicists a number of years ago it was acclaimed as one of the most important developments in the improvement of Roentgen technique.

In this patented system (No. 1,334,936) the X-Ray tube and high tension transformer are immersed in oil and sealed in a compact metal tank. The result is a 100% SHOCKPROOF X-Ray unit which can be brought in direct contact with a patient or doctor with complete immunity from all electrical shock.

When an X-Ray unit is built in this manner, it becomes less bulky, much more flexible and of course adapts itself more readily to the requirements of the work to be done.

The importance of shielding the doctor from an excessive exposure to the X-Rays is a bigger factor today than it was in the days when radiographs were made for only a few operations such as the examination of impacted teeth, abscessed teeth, or when root canal work was being done.

Today, dentists are insisting on complete full mouth X-Ray examinations for those patients who want a full diagnosis of their dental condition, whether they actually have the work done or not. Nothing will stimulate the patient's interest in his dental condition more than a full knowledge of what is wrong.

The consensus of opinion of leading dentists is that at least fourteen films are required to make a complete Roentgenographic examination.

When this or a greater number of exposures are made the areas of the face exposed to the direct X-Rays, necessarily overlap. The older types of apparatus employ direction cones that are much larger than necessary. The cone on the Waite and Bartlett shockproof units prevents this overlapping of exposed areas to a degree that minimizes the possibility of any injury to the patient which would be caused by X-Rays.

The beam of X-Ray from the Waite and Bartlett shockproof unit is narrow, consequently the doctor or nurse has greater range of safety yet the beam is wide enough to cover an eight by ten film at the distance prescribed for the work when this size film is used.

The importance of these factors is stressed in a report of the United States Government Bureau of Standards which is reproduced in part for your information on pages eight and nine.



THE MOBILE MODEL

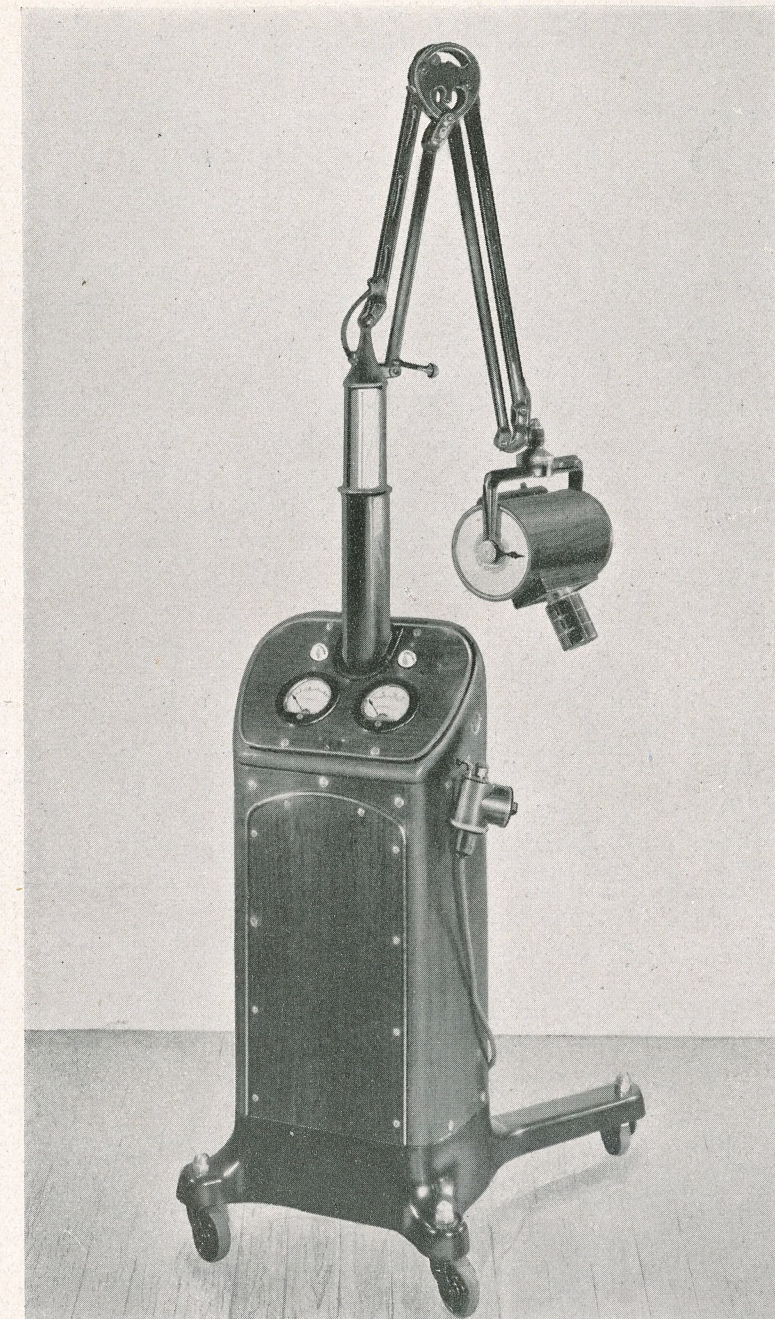
THE new Mobile Model incorporates all the safety features of the well known tripod and wall models. All the mechanical and electrical components are entirely concealed in a beautiful pressed steel cabinet, finished in mahogany and black baked enamel with chromium plated trimmings. The compact and conservative design of this unit blends perfectly with other equipment in all finely appointed offices.

On the panelboard are mounted two indicator lamps and two $4\frac{1}{2}$ inch meters which make for easy reading of the voltage and milliamperage. The cabinet contains a contactor and a circuit breaker protecting the X-Ray transformer and the tube from surges. In addition there is incorporated an insulating auto-transformer which permits the maximum output on line voltages ranging from 95 to 120 volts and a milliampere stabilizer, which holds the milliamperes constant irrespective of line fluctuations.

The folding arm permits an extension of 36 inches. When the unit is moved up to the dental chair, this flexibility enables the radiodontic examinations to be made from any angle without further movement of the apparatus. Exposures are made by hand time switch which ranges in quarter second steps from 0 to 12 seconds.

The tube stand is ingeniously counterbalanced, giving it an ease of movement as though floating in a hydraulic chamber, and is so arranged that there is absolutely no sign of wear on the chromium plated finish of the tube stand itself.

The new Mobile Model is mounted on a substantial cast iron base. The casters, of hard rubber, are ball bearing and easy swiveling, lending the entire apparatus an ease of mobility not heretofore obtained.



THE MOBILE MODEL

THE MOBILE TRIPOD MODEL

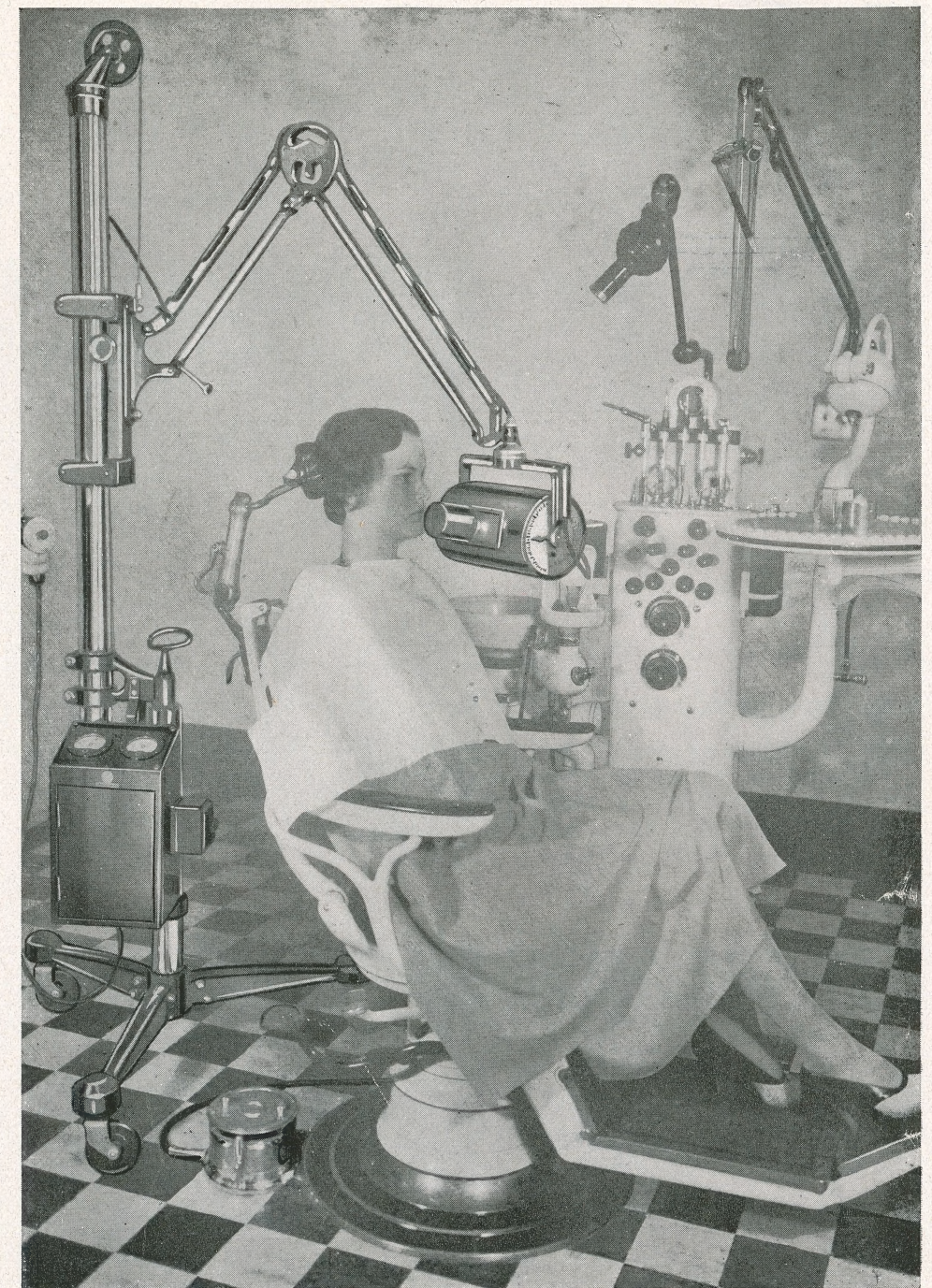
THE Tripod Model is especially valuable in a busy office or clinic because of its wide scope. Not only can any phase of dental radiography be done with it but many other kinds of radiographs can be made.

This type of shockproof X-Ray unit has the advantage of being light in construction and in weight, and therefore easily moved about. It can be rolled into any corner or space available when not in use.

Another valuable feature of the design of this unit is that it can be taken apart for easy transportation in an automobile to the bedside of a patient who cannot be moved to the dentist's office.

Should the dentist ever wish to change the arrangement of his office, this model is desirable in that it can be readily converted into a Wall Model by merely substituting a Wall Mount casting for the Tripod base.

The possibility of the high tension current jumping or arcing to any nearby objects is, as in all the other Waite and Bartlett shockproof units, entirely eliminated because of the absence of any exposed high voltage wires and the use of our oil immersed system.

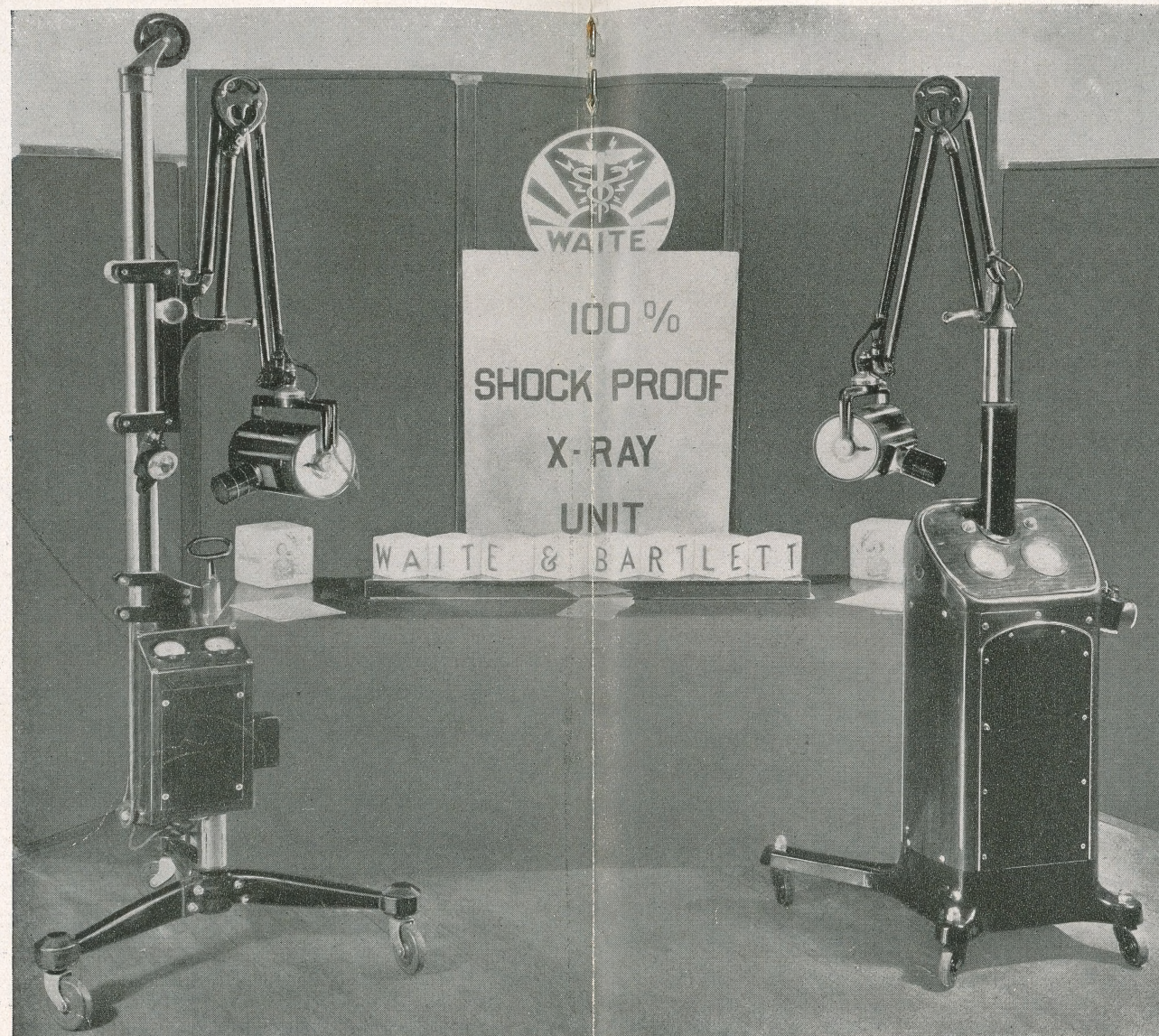


THE MOBILE TRIPOD MODEL

BACKED BY THE OPINION OF
THE UNITED STATES GOVERNMENT BUREAU OF STANDARDS

What this Institution says about the Oil Immersed X-Ray Tube

"Much can be said at this time in favor of the *completely oil-immersed* roentgen-ray tube for high voltages, and its development promises to be one of the most important in the improvement of roentgen technique. When the tube and transformer are in the same grounded case the electrical hazard is entirely eliminated. Such a unit is also adaptable to the perfect roentgen-ray shielding."



The following excerpts are from an article on "Roentgen-Ray Protection" by Lauriston S. Taylor, Associate Physicist of the Bureau of Standards, which appeared in the July, 1929, issue of *The American Journal of Roentgenology and Radium Therapy* and reprinted by authority of the Department of Commerce and the Publishers.

"Much can be said for the development of completely insulated equipment and especial credit is due the manufacturer for his efforts in developing it. One of the most important developments is the *completely oil-immersed* units in which tube and transformer are in a common metal tank, air-sealed and effectively grounded. The electrical hazard in the better types vanishes. A number of such units are now being manufactured up to 90 kv. and undoubtedly will soon be made for any voltage."

THE WALL MOUNT MODEL



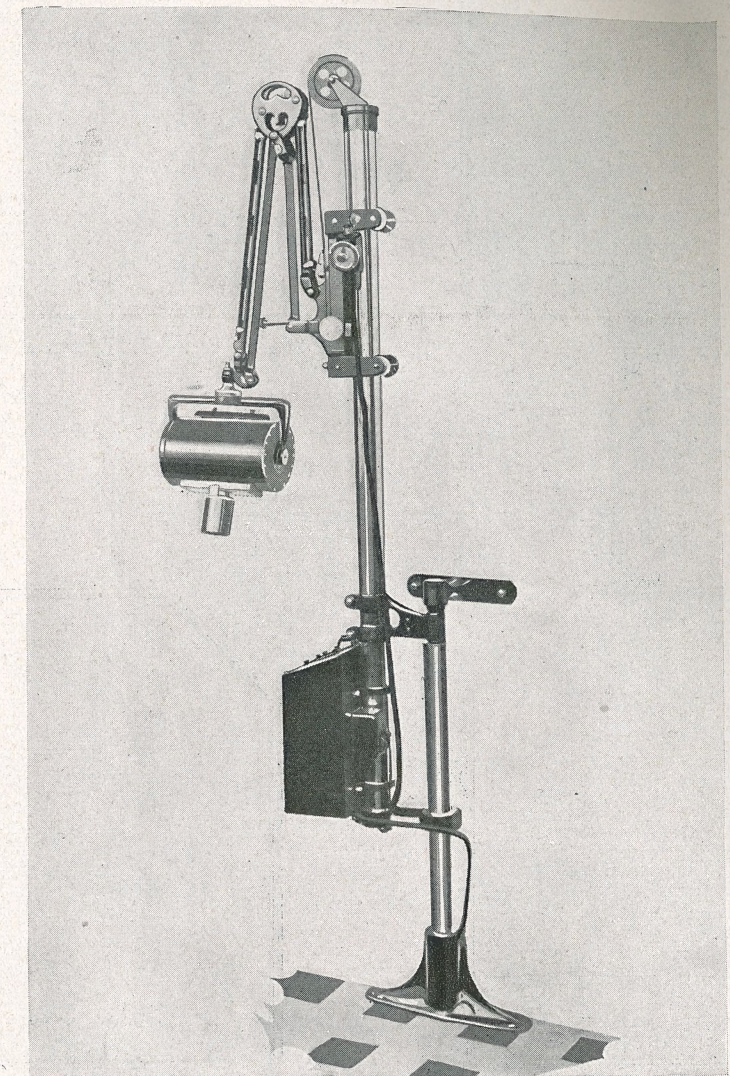
WHERE space is limited, this Model conserves it to a marked degree. In cases of such limited space, where the operating chair is within forty-eight inches of the side wall, the flexibility of this type of mounting, at such a distance, is as great as that of the Mobile Models.



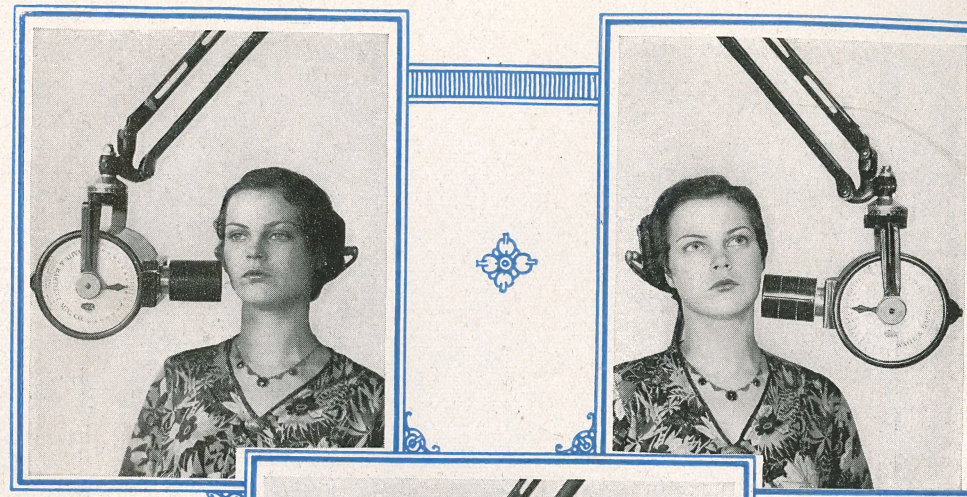
If at any time the dentist wishes to enlarge his facilities the wall model lends itself very readily to his plans, for it can be changed into the Mobile Tripod Model merely by substituting the Tripod Base Mounting for the Wall Model Mounting.



In its other features it is identical with the Mobile Tripod Model and combines all of the well known Waite and Bartlett safety devices, eliminating all high voltage wires and consequent danger of shock.



THE WALL MOUNT MODEL



Lower Right
Molar Teeth
Angle -5°

Lower Left
Molar Teeth
Angle -5°



Lower
Incisor
Teeth
Angle -15°

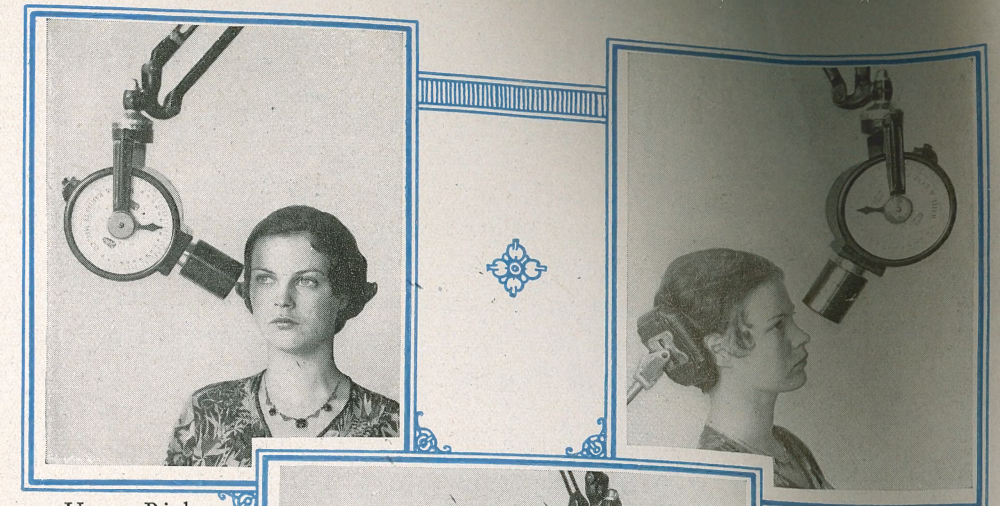
Lower Right Cuspid -20°
and Bicuspid Teeth -10°

Lower Left Cuspid -20°
and Bicuspid Teeth -10°

NO EXPOSED HIGH VOLTAGE WIRES

TUBE POSITIONS FOR

Page Twelve



Upper Right
Molar and
Bicuspid Teeth
Angle $+30^{\circ}$

Upper Incisor
Teeth
Angle $+40^{\circ}$



Upper Left
Cuspid Teeth
Angle $+45^{\circ}$

Upper Right
Cuspid Teeth
Angle $+45^{\circ}$

NO CLUMSY GUARDS TO IMPEDE WORK

RADIOGRAPHING

Page Thirteen

AN EXPLANATION OF THE SHOCK- PROOF X-RAY SYSTEM

IN offering our oil immersed X-Ray tube and transformer to the Dental Profession we feel that this is the best in safety and flexibility that has been accomplished to date. We were pioneers in the use of insulated cables and would still be using them in dental X-Ray machines if we did not feel that this system has been superseded by our present oil immersed method in all phases.

With the insulated cable machine, we found that even pure para rubber when used for the insulation, became brittle in time and broke down. Also the diameter of such insulation for these cables must of necessity be quite large which did not help in making for flexibility or for an easily adaptable mechanism. We therefore perfected our present shockproof system as a solution to the problem. In adapting this system to a usable modern machine, we have been able to conserve a maximum of space, and develop a maximum of adaptability.

When the entire high tension circuit, and this includes the X-Ray tube, is entirely immersed in oil, the high voltage necessary to produce X-Rays is induced under the safest dielectric which has been found.

The oil immersed tube X-Ray unit is being extensively used in operating rooms where anesthetics are administered and due to its shock-proof features there is no danger of an explosion due to free ether gas.

Our research department will be pleased to furnish any further information regarding any phase of apparatus construction upon your request.



STURDINESS

NUMEROUS Waite and Bartlett X-Ray machines that are more than fifteen years old are still in use. Of course, some of the older models are not as flexible as those of later design, but we mention this to point out the sturdiness of construction characteristic of all Waite and Bartlett X-Ray equipment.



Waite and Bartlett apparatus has passed the most rigid tests of the United States Government Departments including those of the United States Navy Department where Waite and Bartlett apparatus is now being used.



Many scientific institutions are using Waite and Bartlett apparatus for research work. Many such institutions have come to Waite and Bartlett for apparatus of special design knowing that the background of many years of research and practical experience we have had would qualify us to build equipment under the most exacting specifications.



Your investment in a Waite and Bartlett dental X-Ray unit will solve your X-Ray problems for many years to come.



SPECIALIZED SERVICE

BEHIND

WAITE & BARTLETT

DENTAL X-RAY UNITS



THE Waite & Bartlett factory is located in Long Island City, N. Y., with an efficient engineering staff that brings instant assistance at any time, should you desire it.

Waite & Bartlett is prepared through this staff to diagnose all radiographic troubles, and to assist in securing the fullest results in the taking of dental radiographs.

*Back of every piece of Waite & Bartlett apparatus
is fifty years of experience in the design and manu-
facture of Electro-Medical and X-Ray Apparatus.*



10-63 JACKSON AVENUE, LONG ISLAND CITY, N. Y.

THE
WAITE & BARTLETT
X-RAY MANUFACTURING CO.

Established 1879

